Energy Efficient Electrode Design to Treat Neurological Disorders

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Technology description

Background

Numerous neurological impairments, including neuromotor deficit, hearing loss, chronic pain, and epilepsy, require the restoration and replacement of bodily functions by virtue of implantable neuroprosthetic devices. Advancements in neuroscience have increased the total market size considerably for various neural stimulation devices that target the spinal cord, cochlear, cerebral cortex, and other peripheral nerves. With advances in neurostimulation technologies, the demand for more precise targeting of neural substrate has fueled the development of higher density electrode arrays to improve the resolution of stimulation outcomes while minimizing unwanted side effects; however, chronic overstimulation is known to cause nerve damage. There is a need for developing higher efficiency, more durable electrodes.

Technology Summary

Researchers at Purdue University have developed new electrode designs to prolong the lifetime and function efficacy of implantable pulse generators. It was found that certain shapes can be used to more efficiently deliver electrical charge for stimulating the nervous system. Data shows that the electrode design reduces power consumption by up to 50 percent while increasing functionality effectiveness.

This new electrode design could be used in implantable simulation systems that are used to treat a large number of neurological disorders. It will work in existing platforms or in a standalone system.

Application area

Implantable neuroprosthetic devices
Implantable pulse generators
Other implantable devices

Advantages

Energy efficient
Increases lifetime of system
Increases functionality effectiveness
Compatible with existing platforms

Institution

Purdue University

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